Quality Improvement Implementation in the Nursing Home

Matthew R. Guldin; Gary J. Young, JD, PhD; Dan R. Berlowitz, MD, MPH

Improving the quality of nursing home care is a national priority. In a recently published report, *Improving the Quality of Long Term Care* (2001), the Institute of Medicine identified quality improvement (QI) as one method by which nursing homes could improve the quality of care. However, the report also acknowledged the lack of evidence regarding the effectiveness of QI in nursing homes and the difficulty in implementing QI in a setting characterized by limited trained staff and organizational capacity.

Increasingly, nursing homes are applying industrial quality control principles to the task of improving care. Quality improvement, also known as continuous quality improvement or total quality improvement, emphasizes developing a structured, organization-wide approach to understanding and improving underlying work processes. In this article, we discuss our recently published study on quality improvement implementation in VA nursing homes.

Background

In theory, QI implementation empowers employees to be actively involved in all aspects of care. A high degree of QI implementation at a nursing home could potentially improve work processes and ultimately lead to a demonstrable improvement in patient outcomes. However, previous research suggests that QI implementation diffusion is often a difficult undertaking. Previous studies from non-nursing home settings have demonstrated that organizational culture - those values, beliefs, and norms of an organization that shape its behavior - is an important determinant of QI implementation. Research has shown that hospitals with a culture that is innovative and supportive of teamwork are more successful in implementing QI.

Quality improvement implementation in nursing homes has not been extensively studied. It has been hypothesized that nursing homes adopt QI as a management tool in response to environmental pressures such as tight reimbursement or market competition. Of course, market forces may be less important in QI implementation in VA nursing homes than private ones, since the VA is a government-funded system.

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Study Design

Some of the hypotheses tested in our study were the following:

- VA nursing homes vary in their implementation of QI practices.
- Nursing homes with a culture that is innovative and supportive of teamwork will have a higher degree of QI implementation.
- Nursing homes with a higher degree of QI implementation have more satisfied employees and a greater rate of self-reported guideline adoption.
- Nursing homes with a higher degree of QI implementation will have better risk-adjusted patient outcomes.

Our study sample consisted of 35 VA nursing homes that varied in size, geographical area, and quality of care as measured by the rate of pressure ulcer development calculated from an administrative database. Data were obtained from three primary sources:

- Information on organizational culture, QI implementation, guideline adoption, and job satisfaction were obtained from a survey of 1,065 nursing home staff.
- Adherence to best practices related to pressure ulcer prevention was abstracted from medical records.
- Risk-adjusted rates of pressure ulcer development were obtained from the Patient Assessment File (PAF), a VA administrative database.

Understanding and Avoiding Errors:
A Crisis Management Example

Jenny W. Rudolph, PhD

Since the mid-1990's VA has placed increasing emphasis on promoting patient safety and avoiding medical error. With its multiple patient safety initiatives in both operations and research, VA is seen as a national leader in addressing medical error and patient safety. One of the areas in which VA has been in the vanguard is identifying and addressing the organizational origins of medical error.

Organizational Origins of Individual Error

In 1999, the Institute of Medicine's report, *To Err is Human,* riveted the nation's attention on the issue of patient safety and error in medicine, highlighting the organizational sources of these errors. The report drew on 20 years of organizational research to show that errors that happen at the "sharp end" of the organization, where nurses and doctors and other health care providers care for patients, are related to organizational factors distant in time and space from where the error occurs. Errors by health care providers are not only the consequence of their immediate actions; these errors are also related to managerial practices, and to structures, incentives, training programs, and systems set "upstream" at the "blunt end" of the organization. The number and severity of errors can be exacerbated or reduced by these managerial and organizational factors.

Ineffective automatic, "knee-jerk" problem solving tactics are one example of the types of errors influenced by organizational factors. People's knee-jerk reactions are shaped by professional training programs (e.g., medical residency) and socialization processes. Socialization processes are the sometimes explicit (e.g., military boot camp), sometimes implicit (a disapproving glance, or a cordial slap on the back) social processes that tell people how to act in organizations. A series of serious accidents in the military, nuclear power, and aviation industries in the 1970's and '80's made all three industries realize that the inadequate automatic problem solving tactics used by their employees to manage crises in-the-making were the result of their own professional training programs and socialization processes and that these needed to be changed to improve safety and reduce error. In all three cases these changes involved developing people's skill in questioning underlying assumptions and communicating more openly about potential errors and areas of uncertainty.

"Fixation Error" in Operating Room Crises

In a recent study, we examined similar kinds of automatic responses in medicine. To the extent that physicians' automatic responses embody the training and socialization they have received, these responses help healthcare administrators and residency directors understand the outcomes of current training and socialization processes.

The study examines the problem-solving tactics used by anesthesia residents in a simulated operating room (OR) crisis. This research sought to understand and reduce fixation, the process of clinging to a single presumed diagnosis despite mounting cues that one is on the wrong track. Transcending fixation error and managing the crisis effectively requires a transition from a routine operating mode, where the underlying situation is assumed to be known and assumptions aren't questioned, to an error-correcting mode that questions one's view of the situation. The necessary shift in cognitive framing is not natural; it requires intelligent effort. It also requires a shift from "self-sealing" communication patterns that keep one's thoughts a mystery and block input from others to "self-correcting" communication patterns that reveal one's reasoning and invite input.

We conducted the study in three parts. First, working in collaboration with faculty at Harvard Medical School, we adapted an existing simulator-based one-day crisis management training program for anesthesia residents to address fixation more directly. Next, we tested the effectiveness of the new training program to reduce fixation by increasing the rate of self-correcting behaviors. Finally, we conducted a quantitative and qualitative analysis of fixation, effective problem solving, and other problem solving failure modes during the simulated crisis and their impact on the quality of clinical problem resolution. The practical goals of the study were to improve patient safety and reduce error by developing and testing a way to reduce fixation-related diagnostic mistakes during anesthesia crises by encouraging the use of self-correcting behaviors.

We examined the actions of forty different second- and third-year anesthesiology residents grappling with a crisis scenario in a high-fidelity OR simulator. The study was conducted at the Center for Medical Simulation, which is sponsored by Harvard University's teaching hospitals and staffed by its faculty. The Center

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includes a fully outfitted OR with a computer-controlled plastic mannequin with heart, lung, and voice sounds, as well as pharmacological reactions to about 100 different medications. In the scenario under study, the trainee confronts ventilation problems caused by secretions in the endotracheal tube, but the clinical signs and timing of the ventilation problem suggest bronchospasm, the diagnosis on which many then fixate. The observational data were augmented by notes from scenario debriefings, and interviews with approximately half the sample.

Assumptions and Communication Patterns Affect Crisis Management

The study found that fixation is reinforced in the collaborative setting (the anesthesiologist calls for another anesthesiologist to help him/her) of the OR by a number of actions and cognitive frames (including assumptions). First, the strong belief that fixated clinicians have in their leading diagnosis not only causes them to discount clinical signs and advice that might rule out that diagnosis, but to make up or distort clinical signs in a way that supports it. For example, after giving a bronchodilator they imagine that it is easier to squeeze air in and out of the patient's lungs, when in fact, the resistance has not changed at all. Second, fixated clinicians tend to proceed as if their diagnosis is reality rather than an inference they have drawn, so they see no need to question or test it. Third, it appears that fixated clinicians weigh the social and/or logistical costs of help seeking more heavily than its benefits. In their actions, fixated clinicians subvert self-correction by using weak diagnostic tests, and by strongly stating their view of the situation over and over, while not asking questions or testing their assumptions by seeking input from others. Additionally, the study found that the higher the amount of self-correcting behavior, the lower the degree of fixation. Further, the higher the degree of fixation, the worse the resolution of the clinical problem.

Qualitative analyses found that fixation was not the only problem-solving failure mode. "Diagnostic vagabonding," in which the clinician roams from diagnosis to diagnosis without testing or treating any one diagnosis thoroughly was just as ineffective as fixation (and more than twice as common). This analysis indicates that both very low commitment to a treatment strategy (trying many different approaches in a superficial way) and very high commitment (i.e. fixation) are unlikely to lead to resolution of the clinical problem. Instead, as the effective problem solvers in the study demonstrated, an approach that is both persistent in ruling out a diagnosis, but flexible in entertaining others appears to be the best strategy.

Implications for Managers

This study adds to our existing understanding of how to manage safety and reliability by vividly highlighting the need for balance between assumption questioning and treatment-oriented action within existing assumptions. Too readily questioning and changing one's diagnostic point of view is just as deadly as rigidly clinging to one view. Contrasting fixation and other problem-solving modes, this study suggests that safety and reliability are enhanced by a strong commitment to a mental model coupled with tests of the model that help the clinician detect and adjust to contradictory data. This study indicates that while generating a differential diagnosis is taught and advocated from the first year of medical school, actually holding several diagnoses in mind simultaneously and ruling them out methodically is difficult and rare.

The fact that it is so difficult for clinicians to generate and use a differential diagnosis, which for managers would be akin to a list of candidate action strategies, indicates that failures to handle OR crises effectively are related not only to technical medical knowledge but also to reflection and communication skills that allow doctors to test their diagnoses on the fly. If residents in this study are representative, the study highlights the fact that current training and socialization processes may be equipping residents with the technical knowledge to solve a clinical problem, but not with the skills in "thinking about their thinking," reflection, and inquiry that allow them to detect and correct diagnostic errors in the midst of an OR crisis.

These findings may well apply to managerial, as well as diagnostic decision-making. In the press of everyday business, it is easy to jump to conclusions without even being aware one has done so, and then pursue a course of action without checking the assumptions underlying

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those conclusions. Similarly, managers often have the feeling they have missed some important strategic option and hunt around for it without testing the strategies they already have in their repertoire.

Quality Improvement
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Results
Analysis of study results shows that:

- There were considerable differences among nursing homes regarding their extent of QI implementation. These differences were not based upon facility size, teaching status, or urban versus rural location.
- Quality improvement implementation was greater in nursing homes that possess an organizational culture that emphasizes innovation and teamwork.
- Employees of nursing homes that reported greater QI implementation had a higher level of job satisfaction and self-reported adoption of pressure ulcer clinical guidelines.
- There was no significant association between a nursing home's QI implementation and either adherence to guideline recommendations as abstracted from medical records or the rate of pressure ulcer development.

Discussion
It is important to recognize that VA nursing homes differ from community nursing homes in two important ways. First, unlike many community nursing homes, VA nursing homes are part of a larger integrated health system that has made a significant investment in QI. A portion of that significant investment is in the form of having access to information and staff resources that may not be available to independent nursing homes. Second, nursing aides within the VA have less turnover than their counterparts in community nursing homes and may be more experienced. These nursing aides may be more accepting of QI practices or may better be able to adopt these practices. Nevertheless, it is likely that the issues faced by VA nursing homes in QI implementation, such as how to focus on consumer needs, implement guidelines, and improve process of care, are similar to issues faced by other nursing homes.

In our study, we found significant differences among VA nursing homes in their implementation of QI practices

and also found that QI implementation is related to organizational culture. In addition, although QI implementation may result in staff who are more satisfied with their jobs and who believe they are providing better care, associations with documented improved care are uncertain. Neither self-reported guideline adoption nor pressure ulcer prevention practices, as documented by the medical record, were associated with the rate of pressure ulcer development.

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Although the results of our study were inconclusive in terms of demonstrating an effect of QI on the quality of care, they do seem to support the importance of developing an organizational culture and capacity for implementing QI. Quality improvement, as well as other interventions to improve care, are unlikely to be successfully implemented in nursing homes that are not suitably predisposed to making the necessary changes in how care is delivered.

Berlowitz DR, Young GJ, Hickey EC, Saliba D, Mittman BS, et al. *Quality improvement implementation in the nursing home.* Health Services Research 2003 Feb;38(1 Pt 1):65-83.